If we assume, as is implicit in the FCC's analysis, that removal of the commissions will not cause a significant change in the availability of hotel phones or pay phones, then we can classify the commissions as transfer payments, not costs. As we showed in detail in our earlier study, OSPs and most providers of pay phones (e.g., hotels and services stations) operate in competitive industries and do not earn supra-competitive rates of return. Hence, they cannot be expected to absorb the loss of revenues and commissions resulting from BPP. It follows that BPP will not transfer income to telephone users from their alleged exploiters. Rather, the loss of revenues and commissions will be flowed through to the general economy; e.g., in the form of higher prices for hotel rooms and gasoline. It requires careful study to understand whether the ultimate result is to transfer income from the wealthy to the poor or from the poor to the wealthy.

Economists have long dealt with the issue of payments that are made without any corresponding change in economic behavior. In various contexts such payments are called economic rent, lump-sum taxes and transfer payments.

The key point is that there is a vast difference between giving ten thousand dollars to charity and spending ten thousand dollars jetting to Vail, staying in an expensive condo, skiing every day and dining well every night. One act merely takes ten thousand dollars out of one of society's pockets and puts it in another. The other represents the real consumption of resources — pilot's time, jet fuel, use of the condo, etc.

When commission payments induce people to behave differently than they would in the absence of such payments, then the commission payments may reflect real costs. For example, suppose the Airport Authority is deciding whether to allocate space to retail sales or pay phones. If the retail merchants are willing to pay $20 per year per square foot for use of the space, but commission revenues would generate revenues of $21 per square foot, then the Airport Authority would choose to use the space for telephones, not for retail sales. In that case, the telephones impose a cost on society of $20 per year per square foot — the benefits foregone by using the space for telephones instead of retail sales. Nowhere does the FCC's analysis argue that society suffers from too great a supply of pay phones or from hotel telephone systems that are of excessively high quality. In fact, the FCC found that there was no convincing evidence that BPP would adversely affect the availability of pay phone service.[28]

The FCC and others (e.g., see Sprint Comments, pp. 16-22) view these commissions as an expense that can be eliminated without any significant change in the availability of telephone services. If so, these commissions reflect not costs but pure transfer payments. Eliminating these commissions redistributes wealth, but does not affect efficiency. Any benefits to one part of society are offset, dollar for dollar, with a cost imposed on another part of society.

To the extent that these transfer payments are replaced by activities that consume resources (e.g., direct mail advertising), then these payments become costs. To a first approximation, the FCC's analysis is precisely wrong – the eliminated commissions measure costs not benefits! Additional marketing costs required in the new environment should be subtracted.

C. Double-Counting Revisited

In our earlier report, we observed that we believed that the FCC's quantitative calculation of the benefits of BPP was also flawed due to a double-counting for which the FCC had not adjusted. We still believe that to be true. We have reviewed our calculation and believe we can now offer a better calculation of the double counting.

In the FNPRM, Appendix B, the commission calculated that BPP would reduce commissions by $360 million, but that this included $17 million of commissions paid on third-tier OSP revenues. The $17 million was calculated to be equal to ($280 million * 50% non-dial [redacted]

We believe that the correct calculation would be ($280 million * 21% commission rate) = $59 million. There is no need for an allowance for dial-around calling. The Lande Report[29] reported that smaller OSPs paid about 21 percent of billed revenues as commissions. Thus, the reduction in third-tier OSP revenues should be weighted by those firms' average commission rate, not the by the average OSP commission rate. Thus, under the FCC's analysis, the decrease in commissions should be adjusted from $360 million to ($360 - 59) = $301 million. Assuming that the FCC's methodology was otherwise correct, combining this with the $280 million of reduced payments would give total benefits of $581 million per year.

D. Higher Long-Distance Charges

If third-tier OSPs could carry traffic as efficiently as the general IXC industry, then the higher long-distance charges identified by the Commission would be wholly transfer payments. Under those circumstances, if BPP were implemented, there would be no savings in society's resources. BPP would simply transfer money from one group in society to another.

In reality, it is quite possible that third-tier OSPs cannot carry traffic as efficiently as the general IXC industry. Under those circumstances, implementing BPP would result in a savings in production costs. The cost savings would represent savings in society's resources — not just transfers from one group to another.

We can put an upper bound on the magnitude of these cost savings. Following the FCC's analysis, we know that third-tier OSPs are willing to carry traffic for an additional cost (relative to general IXCs) of $280 million. In the preceding section, we estimated that they pay additional commissions of $59 million. Consequently, their additional production costs cannot exceed $280 million less $59 million or $221 million. We would expect competitive pressures to reduce any such efficiency gap between the third tier OSPs and other OSPs over time.

[29] TOSCIA Report, Attachment N, p. 13.

E. Summary

We believe that an *upper bound* on the benefits of implementing BPP is $221 million per year. The increased cost of marketing under BPP is, by itself, sufficient to outweigh these benefits.

We do not include commissions in our estimate of benefits of BPP. Commissions are solely transfer payments. They correspond to no savings of society's resources. In the Commission's analysis, BPP does not change the ratio of dial-around to total traffic, hence, there are no savings in dialing time. Under a different scenario, e.g., our low dial-around case, consumers do save slightly on dialing time but at substantial cost (that may be borne by others).

V. Conclusion

Under our base case scenario, we estimate that the costs of BPP equal roughly $1.5 billion per year, or two and a half times the benefits identified by the FCC. Even under extreme low-cost assumptions we estimate that the costs of BPP exceed three-quarters of a billion dollars per year. Under a scenario that considered dial-around at the levels projected by Nynex, the costs of BPP per away-from-home BPP call exceeded the rate reductions the FCC expects BPP to bring to roughly one-eighth of such calls. Under a mildly pessimistic scenario, whose key assumptions were a strong cellular/PCS industry substituting for some pay phone calls, more dial-around, slightly higher costs, and higher IXC marketing costs, the cost-per-call-benefitted (away-from-home BPP calls) shot up to almost three dollars.

We believe that the benefits of BPP are far lower than was indicated in the FCC's analysis. The biggest flaw in that analysis is the treatment of commissions. The FCC's approval would treat a million dollar reduction in payments to the U.S. Park Service like a million dollar benefit to the public. That is unsound economics. Our upper bound on the benefits of BPP is $221 million.

In any event, using either our estimate of the benefits of BPP or the Commission's estimate, our calculations indicate that the costs of BPP would vastly outweigh the benefits.

Given that benchmark regulation of OSPs provides a far less costly way to control the rates charged by OSPs (and one that could be effective in 1995 instead of 1997), implementing BPP would be wasteful and inefficient.

Appendix A: Model Specification

Specification of the SPR BPP Total Social Costs Model for the Base Case

Total_BPP_Costs:A2: 'Strategic Policy Research
Total_BPP_Costs:B2: 'BPP Total Social Costs Worksheet
Total_BPP_Costs:E2: 'Scenario: Base Case (Match FNPRM)
Total_BPP_Costs:I2: "version of
Total_BPP_Costs:J2: @NOW
Total_BPP_Costs:J3: @NOW
Total_BPP_Costs:A4: 'Input Data
Total_BPP_Costs:A5: ^Short Name
Total_BPP_Costs:B5: ^Value
Total_BPP_Costs:C5: ^Description
Total_BPP_Costs:A6: 'OSPMOU
Total_BPP_Costs:B6: 32830000000
Total_BPP_Costs:C6: 'Total Minutes of OSP Traffic (32.8 billion follows the growth rate in FNPRN, note 25 and 25.5 billion minutes reported in 1991 TOSCIA Report)
Total_BPP_Costs:A7: 'BPPCallDuration
Total_BPP_Costs:B7: 20.9/2.8
Total_BPP_Costs:C7: 'Average Duration of a BPP Call. Our value of 7.46 is based on Lande report, Table 4 (20.9/2.8) (minutes/ca lls)
Total_BPP_Costs:A8: 'BPPCallPrice
Total_BPP_Costs:B8: 0.34
Total_BPP_Costs:C8: 'Price per minute to end-user of calls placed under BP P
Total_BPP_Costs:A9: 'FAwayFromHomeOSP
Total_BPP_Costs:B9: 0.7
Total_BPP_Costs:C9: 'Fraction of OSP calls that are made "away-from-home"
Total_BPP_Costs:A10: 'FDialAround
Total_BPP_Costs:B10: 0.5
Total_BPP_Costs:C10: 'Fraction of "away-from-home" calls that dial-around 0 + access (we assume no dial around at home)
Total_BPP_Costs:A11: 'AccessLines
Total_BPP_Costs:B11: 143325000
Total_BPP_Costs:C11: 'Total number of LEC Access lines (from USTA 93, p. 2)
Total_BPP_Costs:A12: 'RHCEA
Total_BPP_Costs:B12: 17+0+1922+6812
Total_BPP_Costs:C12: 'Number of RHC equal access switches (from USTA 93, p. 12)
Total_BPP_Costs:A13: 'RHCnotEA
Total_BPP_Costs:B13: 547+52+70+52

Total_BPP_Costs:C13: 'Number of RHC non equal access switches (from USTA 93
, p. 12)
Total_BPP_Costs:A14: 'IndEA
Total_BPP_Costs:B14: 72+1+174+7814
Total_BPP_Costs:C14: 'Number of independent equal access switches (from UST
A 93, p. 12)
Total_BPP_Costs:A15: 'IndnotEA
Total_BPP_Costs:B15: 1839+172+84+2008
Total_BPP_Costs:C15: 'Number of independent non equal access switches (from
USTA 93, p. 12)
Total_BPP_Costs:A16: 'LECOSSSW
Total_BPP_Costs:B16: 184
Total_BPP_Costs:C16: 'Number of LEC OSS switches (SPR estimate one per LATA plus 20)
Total_BPP_Costs:A17: 'OT$perSPCOffice
Total_BPP_Costs:B17: 75000
Total_BPP_Costs:C17: 'One-time expenditures required to upgrade a stored-
program controlled office to BPP (calculation assumes SP
C office= EA office)
Total_BPP_Costs:A18: 'OT$pernonSPCOffice
Total_BPP_Costs:B18: 10000
Total_BPP_Costs:C18: 'One-time expenditures required to upgrade a non store
d-program controlled office to BPP
Total_BPP_Costs:A19: 'MOUperTrunk
Total_BPP_Costs:B19: 5000

Total_BPP_Costs:C19: 'Minutes of traffic carried by an average end-office -
- OSS trunk in a month
Total_BPP_Costs:A20: 'OT$perTrunk
Total_BPP_Costs:B20: 100
Total_BPP_Costs:C20: 'The one-time (rearrangement) costs for added voice-gr
ade trunk from an end-office to a OSS switch
Total_BPP_Costs:A21: 'OT$perLECOSSSwitch
Total_BPP_Costs:B21: 1000000
Total_BPP_Costs:C21: 'The one-time costs of upgrading a LEC OSS switch to s
upport BPP
Total_BPP_Costs:A22: 'AddSetupCostsperBPPCall
Total_BPP_Costs:B22: 0.15
Total_BPP_Costs:C22: 'The average additional costs imposed by the process o
f setting-up a BPP call
Total_BPP_Costs:A23: 'AddCostPerBPPMou
Total_BPP_Costs:B23: 0.0049*(0.65+0.25)
Total_BPP_Costs:C23: 'The average additional per minute BPP cost. $0.0044
= 0.49 cents per minute (Bell Atlantic tandem cost) ti
mes 0.9
Total_BPP_Costs:A24: 'NetCostLargerIXC
Total_BPP_Costs:B24: (68+19.5+6.5)*1000000
Total_BPP_Costs:C24: 'One-time network costs for larger IXCs, see FCC FNPRM
M para 28
Total_BPP_Costs:A25: 'NetCostSmallIXCs
Total_BPP_Costs:B25: 26000000
Total_BPP_Costs:C25: 'One-time network costs for smaller IXCs, see FCC FNPR
MM para 28
Total_BPP_Costs:A26: 'CapSwitches
Total_BPP_Costs:B26: 50
Total_BPP_Costs:C26: 'Number of CAP switches that will have to be modified
by 1997
Total_BPP_Costs:A27: 'CellularPCSSwitches
Total_BPP_Costs:B27: 200
Total_BPP_Costs:C27: 'Number of cellular, PCS, SMRS switches that will have
to be upgraded or modified by 1997
Total_BPP_Costs:A28: 'AnnualGrowthRateCellularPCSswitches
Total_BPP_Costs:B28: 0.1
Total_BPP_Costs:C28: 'The assumed growth rate for Cellular/PCS/CAP switches
.
Total_BPP_Costs:A29: 'OT$IXCMarketing
Total_BPP_Costs:B29: 0.03
Total_BPP_Costs:C29: 'The IXC marketing expense associated with the balloti
ng/open season for 0+ presubscription as a fraction of
five years BPP revenues for customers who return ball

ots
Total_BPP_Costs:A30: 'IXCMarketingFOSPCallRevs
Total_BPP_Costs:B30: 0.08
Total_BPP_Costs:C30: 'Continuing IXC marketing expense as a fraction of tot
al BPP revenues
Total_BPP_Costs:A31: 'CustperLoop
Total_BPP_Costs:B31: 1/1.3
Total_BPP_Costs:C31: 'The ratio of customers to access lines (allowance for
multi-loop customers)
Total_BPP_Costs:A32: 'CostBallotSent
Total_BPP_Costs:B32: 0.5
Total_BPP_Costs:C32: 'The cost to a LEC for each ballot mailed
Total_BPP_Costs:A33: 'CostBallotReturned
Total_BPP_Costs:B33: 0.5
Total_BPP_Costs:C33: 'The cost to a LEC for processing each returned ballot
Total_BPP_Costs:A34: 'CostperInquiry
Total_BPP_Costs:B34: 1.5
Total_BPP_Costs:C34: 'The cost to the LEC for processing each telephone inq
uiry regarding the 0+ equal access ballot process
Total_BPP_Costs:A35: 'FSubsReturningBallot
Total_BPP_Costs:B35: 0.2
Total_BPP_Costs:C35: 'The fraction of subscribers returning ballots

Total_BPP_Costs:A36: 'FSubsMakingInquiry
Total_BPP_Costs:B36: 0.15
Total_BPP_Costs:C36: 'The fraction of subscribers inquiring about the 0+ ba
llot process
Total_BPP_Costs:A37: 'LECAnnualChurn
Total_BPP_Costs:B37: 0.2
Total_BPP_Costs:C37: 'The fraction of LEC customers who subscribe anew to s
ervice each year (moves, etc.)
Total_BPP_Costs:A38: 'CellularAnnualChurn
Total_BPP_Costs:B38: 0.4
Total_BPP_Costs:C38: 'The fraction of cellular customers who subscribe anew
to service each year (moves, etc.), change cellular c
arriers or change IXCs
Total_BPP_Costs:A39: 'CellularCustomers
Total_BPP_Costs:B39: 20000000*(1.3)^3
Total_BPP_Costs:C39: 'The number of cellular/PCS customers (assume 30 perce
nt growth for three years from 20 million base)
Total_BPP_Costs:A40: 'ConsumerTime$
Total_BPP_Costs:B40: 10
Total_BPP_Costs:C40: 'The value of consumer's time (dollars/hour)
Total_BPP_Costs:A41: 'ConsumerMinperBallot
Total_BPP_Costs:B41: 2
Total_BPP_Costs:C41: 'The average number of minutes it takes a consumer to
read and understand a ballot, and, if motivated, fill
out it out, insert and mail and/or inquire about ball
ot.
Total_BPP_Costs:A42: 'AmortFactor
Total_BPP_Costs:B42: 0.3
Total_BPP_Costs:C42: 'The amortization/depreciation factor used to convert
one-time network expenses to annualized costs
Total_BPP_Costs:A43: 'SocialInterest
Total_BPP_Costs:B43: 0.05
Total_BPP_Costs:C43: 'The amortization factor used to convert other one-tim
e expenses to annual charges.
Total_BPP_Costs:A44: 'ElasticityEffectFactor
Total_BPP_Costs:B44: 0.16
Total_BPP_Costs:C44: 'The elasticity effect coefficient -- the ratio of co
nsumer welfare loss from increased long-distance charg
es to increases in access charges
Total_BPP_Costs:A46: 'Results
Total_BPP_Costs:A47: 'Cost-Causing Element
Total_BPP_Costs:B47: 'Number
Total_BPP_Costs:C47: ^Network Costs
Total_BPP_Costs:E47: ^Marketing Costs

Total_BPP_Costs:G47: ^Administrative Costs
Total_BPP_Costs:I47: ^Consumer Response
Total_BPP_Costs:C48: ^One Time
Total_BPP_Costs:D48: ^Recurring
Total_BPP_Costs:E48: ^One Time
Total_BPP_Costs:F48: ^Recurring
Total_BPP_Costs:G48: ^One Time
Total_BPP_Costs:H48: ^Recurring
Total_BPP_Costs:I48: ^One Time
Total_BPP_Costs:J48: ^Recurring
Total_BPP_Costs:A49: 'Access Lines
Total_BPP_Costs:B49: +ACCESSLINES
Total_BPP_Costs:G49:
+B49*CUSTPERLOOP*(COSTBALLOTSENT+FSUBSRETURNINGB*COSTB
ALLOTRETUR+FSUBSMAKINGINQU*COSTPERINQUIRY)
Total_BPP_Costs:H49:
+LECANNUALCHURN*B49*CUSTPERLOOP*(FSUBSRETURNINGB*COSTB
ALLOTRETUR+FSUBSMAKINGINQU*COSTPERINQUIRY)
Total_BPP_Costs:I49:
+CUSTPERLOOP*B49*(CONSUMERMINPERB/60)*CONSUMERTIME$
Total_BPP_Costs:J49: +LECANNUALCHURN*I49
Total_BPP_Costs:A50: 'LEC Central Office Switches
Total_BPP_Costs:A51: ' RHC Equal Access
Total_BPP_Costs:B51: +RHCEA
Total_BPP_Costs:C51: +RHCEA*OT$PERSPCOFFICE

```
Total_BPP_Costs:A52:  '   RHC Non-Equal Access
Total_BPP_Costs:B52:  +RHCNOTEA
Total_BPP_Costs:C52:  +RHCNOTEA*OT$PERNONSPCOFF
Total_BPP_Costs:A53:  '   Independent Equal Access
Total_BPP_Costs:B53:  +INDEA
Total_BPP_Costs:C53:  +INDEA*OT$PERSPCOFFICE
Total_BPP_Costs:D53:  0
Total_BPP_Costs:A54:  '   Independent Non-Equal Access
Total_BPP_Costs:B54:  +INDNOTEA
Total_BPP_Costs:C54:  +INDNOTEA*OT$PERNONSPCOFF
Total_BPP_Costs:A55:  'Calls using BPP
Total_BPP_Costs:B55:  +BPPMOU/BPPCALLDURATION
Total_BPP_Costs:D55:  +B55*ADDSETUPCOSTSPE
Total_BPP_Costs:A56:  'Minutes of Use Via BPP
Total_BPP_Costs:B56:  +OSPMOU*(1-FAWAYFROMHOMEOS*FDIALAROUND)
Total_BPP_Costs:C56:  (BPPMOU/(12*MOUPERTRUNK))*OT$PERTRUNK
Total_BPP_Costs:D56:  +BPPMOU*ADDCOSTPERBPPMO
Total_BPP_Costs:A57:  'LEC  OSS Switches
Total_BPP_Costs:B57:  +LECOSSSW
Total_BPP_Costs:C57:  +LECOSSSW*OT$PERLECOSSSWI
Total_BPP_Costs:A58:  'Larger IXCs
Total_BPP_Costs:B58:  @NA
Total_BPP_Costs:C58:  +NETCOSTLARGERIX
Total_BPP_Costs:E58:  +OT$IXCMARKETING*5*I72*FSUBSRETURNINGB
Total_BPP_Costs:F58:  +I69*IXCMARKETINGFOS
Total_BPP_Costs:A59:  'Smaller IXCs and OSPs
Total_BPP_Costs:B59:  @NA
Total_BPP_Costs:C59:  +NETCOSTSMALLIXC
Total_BPP_Costs:A60:  'CAP switches
Total_BPP_Costs:B60:  +CAPSWITCHES
Total_BPP_Costs:C60:  +B60*OT$PERSPCOFFICE
Total_BPP_Costs:D60:  +C60*ANNUALGROWTHRAT
Total_BPP_Costs:H60:  '
Total_BPP_Costs:A61:  'Cellular/PCS Carrier Switches
Total_BPP_Costs:B61:  +CELLULARPCSSWIT
Total_BPP_Costs:C61:  +OT$PERSPCOFFICE*B61
Total_BPP_Costs:D61:  +C61*ANNUALGROWTHRAT
Total_BPP_Costs:G61:
+CELLULARCUSTOME*(COSTBALLOTSENT+FSUBSRETURNINGB*COSTB
            ALLOTRETUR+FSUBSMAKINGINQU*COSTPERINQUIRY)
Total_BPP_Costs:H61:
+CELLULARCUSTOME*CELLULARANNUALC*(FSUBSRETURNINGB*COST
            BALLOTRETUR+FSUBSMAKINGINQU*COSTPERINQUIRY)
```

Total_BPP_Costs:I61:
+CELLULARCUSTOME*(CONSUMERMINPERB/60)*CONSUMERTIME$
Total_BPP_Costs:J61: +CELLULARANNUALC*I61
Total_BPP_Costs:A62: 'Consumer Surplus Loss
Total_BPP_Costs:B62: @NA
Total_BPP_Costs:J62: (D63+C63*AMORTFACTOR)*ELASTICITYEFFEC
Total_BPP_Costs:A63: 'Total
Total_BPP_Costs:C63: @SUM(C49..C62)
Total_BPP_Costs:D63: @SUM(D49..D62)
Total_BPP_Costs:E63: @SUM(E49..E62)
Total_BPP_Costs:F63: @SUM(F49..F62)
Total_BPP_Costs:G63: @SUM(G49..G62)
Total_BPP_Costs:H63: @SUM(H49..H62)
Total_BPP_Costs:I63: @SUM(I49..I62)
Total_BPP_Costs:J63: @SUM(J49..J62)
Total_BPP_Costs:A65: 'Total one time costs
Total_BPP_Costs:B65: +C63+E63+G63+I63
Total_BPP_Costs:A66: 'Total recurring costs
Total_BPP_Costs:B66: +D63+F63+H63+J63
Total_BPP_Costs:C66: 'per year
Total_BPP_Costs:E66: ^OSP traffic division under this scenario
Total_BPP_Costs:A67: 'Total annualized costs
Total_BPP_Costs:B67:
+B66+C63*AMORTFACTOR+(E63+G63+I63)*SOCIALINTEREST
Total_BPP_Costs:C67: 'per year
Total_BPP_Costs:E67: ^Category
Total_BPP_Costs:G67: ^Annual Minutes

Total_BPP_Costs:H67: ^Calls
Total_BPP_Costs:I67: ^Value
Total_BPP_Costs:E68: 'BPP at home
Total_BPP_Costs:G68: +OSPMOU*(1-FAWAYFROMHOMEOS)
Total_BPP_Costs:H68: +G68/BPPCALLDURATION
Total_BPP_Costs:I68: +G68*BPPCALLPRICE
Total_BPP_Costs:A69: 'Cost per call routed using BPP
Total_BPP_Costs:B69: +B67/B55
Total_BPP_Costs:C69: 'per call
Total_BPP_Costs:E69: 'BPP away from home
Total_BPP_Costs:G69: +OSPMOU*FAWAYFROMHOMEOS*(1-FDIALAROUND)
Total_BPP_Costs:H69: +G69/BPPCALLDURATION
Total_BPP_Costs:I69: +G69*BPPCALLPRICE
Total_BPP_Costs:A70: 'Cost per "away-from-home" BPP call
Total_BPP_Costs:B70:
+B67/((OSPMOU/BPPCALLDURATION)*FAWAYFROMHOMEOS*(1-FDIA
LAROUND))
Total_BPP_Costs:C70: 'per call
Total_BPP_Costs:E70: 'Dial around (access code)
Total_BPP_Costs:G70: +OSPMOU*FAWAYFROMHOMEOS*FDIALAROUND
Total_BPP_Costs:H70: +G70/BPPCALLDURATION
Total_BPP_Costs:I70: +G70*BPPCALLPRICE
Total_BPP_Costs:A71: 'Cost per minute of BPP traffic
Total_BPP_Costs:B71: +B67/G72
Total_BPP_Costs:C71: 'per minute
Total_BPP_Costs:E71: 'Total OSP
Total_BPP_Costs:G71: @SUM(G68..G70)
Total_BPP_Costs:H71: @SUM(H68..H70)
Total_BPP_Costs:I71: @SUM(I68..I70)
Total_BPP_Costs:A72: 'Cost per "away-from-home" BPP minute of use
Total_BPP_Costs:B72: +B67/G69
Total_BPP_Costs:C72: 'per minute
Total_BPP_Costs:E72: 'Total BPP
Total_BPP_Costs:G72: @SUM(G68..G69)
Total_BPP_Costs:H72: @SUM(H68..H69)
Total_BPP_Costs:I72: @SUM(I68..I69)
Total_BPP_Costs:A73: 'Network costs for "away-from-home" BPP calls
Total_BPP_Costs:B73:
(AMORTFACTOR*C63+D63)/((OSPMOU/BPPCALLDURATION)*FAWAYF
ROMHOMEOS*(1-FDIALAROUND))
Total_BPP_Costs:C73: 'per call
Total_BPP_Costs:A74: 'LEC network cost for "away-from-home" BPP calls
Total_BPP_Costs:B74:
(@SUM($Total_BPP_Costs:$C$51..$C$57)*AMORTFACTOR+@SUM(

$Total_BPP_Costs:$D$55..$D$56))/(H69)
Total_BPP_Costs:C74: 'per call
Total_BPP_Costs:A75: 'Total cost per access line
Total_BPP_Costs:B75: +B67/(B49*12)
Total_BPP_Costs:C75: 'per month
Total_BPP_Costs:A76: 'LEC network cost per access line
Total_BPP_Costs:B76:
(@SUM($Total_BPP_Costs:$C$51..$C$57)*AMORTFACTOR+@SUM(
$Total_BPP_Costs:$D$55..$D$56))/(B49*12)
Total_BPP_Costs:C76: 'per month

Appendix B: Derivation of Surplus Loss

Appendix B: Derivation of Surplus Loss

This appendix develops a first-order approximation for surplus loss. The surplus loss is related to the gain in revenues. The gain in revenues (from switched access) is to be used to fund the costs of BPP.

First-Order Approximations

In general, the first-order approximation for surplus gain is:

$$SL = -(p - mc)\,\Delta q \tag{1}$$

where,

SL	=	surplus loss,
p	=	price,
mc	=	marginal cost,
q	=	quantity, and
Δ		denotes increment.

Eq. (1) reflects pure economic waste. The *total* loss to users of switched access is many times larger (equal to the revenue gain). Total loss includes transfer payments by which the beneficiaries of BPP gain at the expense of general users of switched access. All our subsequent calculations are based on surplus loss — not total loss.

The first-order approximation of elasticity of demand is:

$$\xi_{SA} = \frac{\Delta q/q}{\Delta p/p} \tag{2}$$

where,

ξ_{SA} = elasticity of demand for switched access.

It follows from Eq. (2) that:

$$\Delta q = \xi_{SA}\, q \left(\frac{\Delta p}{p}\right) \tag{3}$$

Substituting Eq. (3) in Eq. (1), we have:

$$SL = -(p - mc)\ \xi_{SA}\ q\ (\frac{\Delta p}{p}) \tag{4}$$

The first-order approximation for revenue gain is:

$$RG = q\ \Delta p \tag{5}$$

where,

RG = revenue gain.

Substituting Eq. (5) in Eq. (4), we have:

$$SL = -(\frac{p - mc}{p})\ \xi_{SA}\ RG \tag{6}$$

Elasticity of Demand

We assume that price changes in access are passed on in the form of higher long-distance rates. It follows that increases in the price of switched access will suppress demand for long-distance services.

We now define "switched telecommunications services" in terms of their use of switched access. That is,

- Duodirectional services that use domestic switched access at both ends are given a weight of 1.
- Unidirectional services that use domestic switched access at one end are given a weight of 1/2. These services include international message toll service, as well as WATS and 800 services.
- Services that do not use switched access at either end are excluded.[30]

According to this definition, switched access is used in fixed proportions to produce switched services. It follows that a change in the price of access has the same effect on demand as an equal change (cents per minute) in the price of switched services. Consequently, the elasticity

[30] This same approach to defining switched services was used in Richard Schmalensee and Jeffrey H. Rohlfs, *Productivity Gains Resulting from Interstate Price Caps for AT&T*, Washington, D.C., September 3, 1992.

of demand for switched access is proportional to the elasticity of demand for switched services. In particular,

$$\xi_{SA} = f\ \xi_{SS} \tag{7}$$

where,

ξ_{SS}	=	the elasticity of demand for switched services, and
f	=	the fraction of access revenues divided by total switched-service revenues.

Substituting Eq. (7) in Eq. (6), we get

$$SL = -\left(\frac{p - mc}{p}\right) f\ \xi_{SS}\ RG \tag{8}$$

This is our formula for surplus gain.

Data

The remainder of this Appendix seeks, through use of data, to attach a numerical value to *SL*.

Recent studies have estimated the demand for switched services to be about -0.7.[31] That is,

$$\xi_{SS} = -0.7 \tag{9}$$

According to data provided by AT&T, the ratio of interstate switched access revenues to interstate switched service revenues is 0.367. That is,

$$f = 0.367 \tag{10}$$

We estimate the price of switched access as the 1991 ratio of interstate switched access revenues to interstate switched access minutes. That price is:

$$p = \$0.0358 \tag{11}$$

Our procedure for estimating marginal cost follows Monson and Rohlfs:[32]

> Some publicly available estimates can be used to show the range of long-run incremental costs in 1990 using California data. [Footnote: Bridger M. Mitchell, *Incremental Costs of Telephone Access and Local Use* (Santa Monica,

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[31] *See* J.P. Gatto *et al.*, "Interstate Switched Access Demand Analysis," in *Information Economics and Policy*, Vol. 3, No. 4, 1988, p. 344.

[32] Calvin S. Monson and Jeffrey H. Rohlfs, *The $20 Billion Impact of Local Competition in Telecommunications*, July 16, 1993.

Calif.: The RAND Corporation, 1990).] He found that the long-run incremental cost of local usage is between \$0.00025 and \$0.0005 per minute. [Footnote: Mitchell's numbers assume 100 calls per month. We have assumed a 4-minute average call (consistent with his data) to express his per call numbers on a per minute basis.] For calls that travel between 9 and 16 miles, he found the long-run incremental cost to be between \$0.00175 and \$0.003 per minute. For longer haul calls, he found the long-run incremental cost to be between \$0.0015 and \$0.003 per minute.

Lewis J. Perl and Jonathan Falk estimated costs using econometric methods. [Footnote: Lewis J. Perl and Jonathan Falk, "The Use of Econometric Analysis in Estimating Marginal Cost," presented at the Bellcore and Bell Canada Industry Forum, San Diego, California (Apr. 6, 1989).] Their analysis suggested a long-run marginal cost of \$0.01 to \$0.03 per minute, which is somewhat higher than Mitchell's per call numbers that were calculated using an engineering estimation approach.

By taking the high end of these estimates one can calculate a conservative estimate of the marginal cost of switched access: namely \$0.013 at each end.

It follows that,

$$mc = 0.013 \tag{12}$$

Substituting Eqs. (9) to (12) in Eq. (8), we get:

$$SL = 0.16\ RG \tag{13}$$